

Clandestine Insertions

by GySgt Jose A. Torres

To meet today's threat and retain our effectiveness, we must understand the technical side of clandestine insertions.

One of the operational procedures most often employed to insert reconnaissance teams into hostile littorals is the over-the-horizon (OTH) transit employing rubber boats. During this type of insertion, success is defined as the reconnaissance element arriving on target, on time, undetected. Currently, however, the Marine Corps individual training standards dealing with the amphibious insertion of reconnaissance teams, employing boats and scout-swimmers, may not reflect the mission training levels necessary to guide a unit through the training required to conduct a clandestine amphibious approach onto a hostile beach.

For a reconnaissance team approaching a hostile shore, the largest threat may be opposing infantry, equipped with night observation devices (NODs) and thermal imagery devices, and capable of bringing effective fires on the reconnaissance team, or capable of relaying its discovery to a surface craft with intercept capabilities. This threat is ever more real as NODs, thermal imagery intensifiers, or laser warning receivers become available worldwide. In order for our reconnaissance Marines to execute a successful infiltration, we must be able to defeat the threat of hostile forces equipped with this technology. Ultimately, the success of the insertion of the landing force reconnaissance element is dependent on thorough and detailed planning, and upon the element's ability to remain undetected on its approach to the beach. Yet, across the Marine Corps, we are not

training to conduct this task effectively. The current standard guides the reconnaissance team to train to maintain a 500-meter standoff while deploying scout-swimmers and 1,000-meter standoff while deploying underwater swimmers. These distances expose the reconnaissance team to observation and direct fire weapons.

Developing New Standards

Without a doubt, the waterborne approach of the reconnaissance element should be conducted from over the horizon. This is essential to the reconnaissance team's survivability. Determining where "the horizon" is for small-boat operations involves the height of the observer in relation to the distance and altitude

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above sea level of the approaching craft. It may also be defined as the "geographic range of visibility." For planning purposes, (and to develop the training standard), a calculation of the over-the-horizon distance must be conducted considering the intended landing area and the available delivery vehicle. The first necessary calculation is the distance from the shore-based radar (or land-based observer) to the horizon tangent. The second calculation is the distance to the point of tangency (depending on the altitude above sea level of the delivery craft). Both

calculations must be conducted during the planning phase of the operation. Combined, they will give us the true distance to the horizon for a specific craft and a particular beach landing site. The formula employed to determine distances to the horizon and to different points of tangency using both the seaward and shoreline perspective are provided in TC 31-25, *SF Waterborne Operations* (Unclassified). This concept is depicted in the diagrams on the following page.

Diagram 1 represents a radar or observer located (d) feet above sea level with a radar-horizon tangent distance of (e1) where (R) is the radius of the earth (3,441.15 nautical miles).

Diagram 2 represents the distance at which a shore inbound craft becomes "visible" to radar or to a shore-based observer. Where d is the altitude above sea level of the inbound aircraft or height of surface ship, b is the point of radar tangency, e2 is the distance of the inbound craft from the point of tangency, and c is the distance, or location, where the inbound craft crosses the radar-horizon tangent: (c) is the "true" relative distance to the horizon (e1 + e2).

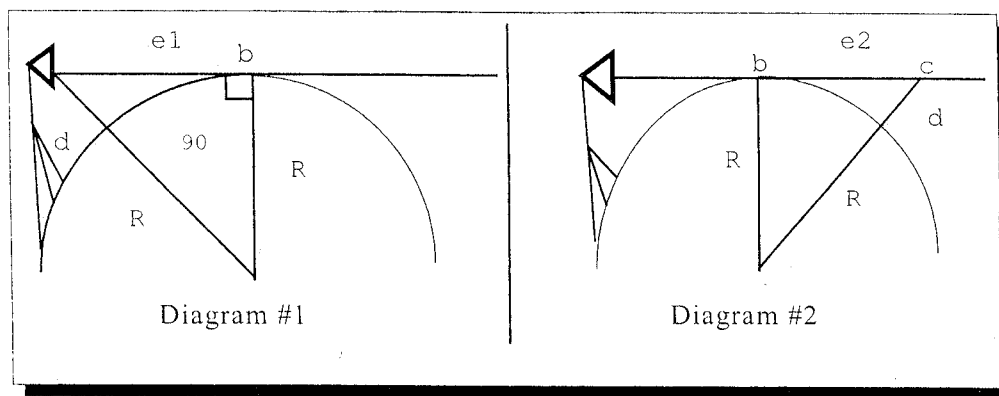
Hence, for us to be able to determine the true distance to the horizon during a singular operation, we must add the shore-based observer or radar distance to the horizon, and the point of tangency of the delivery craft.

The delivery craft currently in stock in the Marine Corps inventory and available to all reconnaissance

units is the combat rubber raiding craft (CRRC). The CRRC has a height of approximately 2 feet above sea level while afloat. If we determine the immediate threat to be a hostile infantryman equipped with NODs or other thermal imagery device with line of sight (LOS) capability, the following figures would apply: LOS distance ("the horizon") for a man standing on shore (height of 6 feet) is 2.6 nautical miles. The distance to a point of tangency for a CRRC is 1.50 nautical miles. Therefore, the closest CRRC approach to hostile beach, before becoming "visible" to thermal imagery or other NOD, is 4.1 nautical miles (or 7.5 kilometers). The assumption is a flat shoreline and zero sea state.

Therefore, in order to maintain the tactical surprise, and to ensure the integrity of the insertion of the reconnaissance element, scout-swimmers must be deployed from a distance of no less than 7.5 kilometers. This should be our minimum training standard. With minimum combat equipment, this swim may be conducted in 3.15 hours at a swim rate of 1.3 knots. However, the time may be considerably shortened by employing the off-set method, and utilizing the tides and currents to the swimmers' advantage. Training to a lesser standard may not prepare us to the fullest extent, and may jeopardize our survivability.

Working on our behalf are several factors that may reduce the "visibility" or the thermal signature of the reconnaissance CRRC. Sea state conditions, temperatures, and atmospheric conditions should all be considered when attempting to determine the swimmers launch point and distance to the beach. The sea state condition may reduce the effect and range of the image intensifier. For instance, a reconnaissance team approaching a hostile beach with a plunging surf of 4 feet may be able to "hide" behind the surf, and therefore reduce its chance of detection. A higher sea state is more



Based on Diagram 1, (a shore-based perspective), the following distances apply:

RADAR ALT IN FEET (d)	DISTANCE TO HORIZON (e1)
2	1.50 NM
6	2.60
10	3.36
20	4.75

In relation to Diagram 2, (a seaward perspective), the following distances apply:

AIRCRAFT/SHIP ALT IN FEET (b)	DISTANCE TO POINT OF TANGENCY (e2)
2	1.50 NM
6	2.60
10	3.36
20	4.75

likely to conceal the heat output of the reconnaissance CRRC. Temperature differentials are also a factor when considering the "thermal visibility" of a CRRC. The greatest heat signature of the CRRC is emitted by the outboard engine. However, consideration should be given to the difference between the air/sea temperature, and the heat source. The greater the heat source and the environmental differential, the greater the vulnerability of the reconnaissance team to detection. Measures should be taken to reduce or conceal the heat output of the CRRC.

Case Review

During the early hours of Operation RESTORE HOPE in 1994, we saw an example of what the current optical technology can do: Swimmers arriving on the beach were clearly exposed by cameras, lights, and reporters. According to the Marine sergeant in charge of the reconnaissance team that conducted the landing during the early hours of the operation, the team had no chance of avoiding the reporters. For the insertion of the reconnaissance element during this operation, an 18-nautical mile transit was conducted.

Yet, even with an over-the-horizon transit, that particular night we did not beat technology. Our reconnaissance element was spotted, and exposed to observation by CNN's night vision and thermal imagery devices. The observation devices employed by the reporters are easily available in the open market, and may be representative of the anticipated threat. There may be a need to re-evaluate our training and operational standards. Since the only way to currently defeat this technological threat is to deploy scout-swimmers from distance outside of the LOS range of the observation device. These swimmers must execute a clandestine landing, and in turn choose a clear and uncompromised beach landing site for the main reconnaissance element or the landing force proper. Unless we take steps to address this training standard shortfall, we are destined to make another cameo appearance in "Enter the Swimmers Part II," as produced by CNN.

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